REMARKS

The Office Action mailed on March 22, 2005 ("Office Action") rejected claims 1-28 of this application. Claims 1, 4-15, and 25-28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of LaLiberte et al., "A Protocol for Scalable Group and Public Annotations," printed on 10/1998, <http://www.hypernews.org>, page 1-9 (hereinafter "LaLiberte") in view of MacNaughton et al., U.S. Patent No. 6,020,884 (hereinafter "MacNaughton"). Claims 2-3 and 16-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of LaLiberte and MacNaughton, as applied to Claims 1, 4-15, and 25-28, and further in view of Eintracht et al., U.S. Patent No. 6,687,878 B1 (hereinafter "Eintracht").

Pursuant to 37 C.F.R. § 1.111, and for the reasons set forth herein, applicants respectfully request reconsideration and allowance of this application.

Prior to discussing the reasons why applicants believe that all of the claims in this application are allowable, a brief discussion of the present invention, followed by a brief discussion of the cited and applied references, is presented. The following discussions of applicants' invention and the cited and applied references are not provided to define the scope or interpretation of any of the claims of this application. Instead, these discussions are provided to help the United States Patent and Trademark Office better appreciate important claim distinctions discussed thereafter.

Summary of the Invention

The present invention addresses one of the shortcomings of previous forms of providing content by providing a scalable computing system that associates annotations with content sources. The annotations are stored on the servers of the highest order tiers of a multiple-tier annotation system wherein each higher tier server includes more annotation information than lower tier servers.

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1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

An exemplary system embodying the present invention includes one or more tier III servers for storing annotations associated with one or more content sources. The annotations stored on the tier III server are indexed on one or more tier II servers. In turn, the location of the index is stored on one or more tier I servers. Inquiries sent to the tier I server identify a relevant tier II server or servers and inquiries sent to the tier II server or servers identify a relevant tier III server or servers. Obviously, embodiments of the present invention can include more than three tiers of servers, three being the minimum. In the exemplary three-tier embodiment, tier I servers are rapid access servers that, in response to the receipt of a document identifier, quickly advise a user if annotations exist for a content source and the location of an index of such annotations. The tier II servers store the indices and, in response to a user query, provide index information, which identifies the tier III servers storing the annotations.

As can be seen from the above description, the present invention provides multiple tiers of servers that progressively provide more specific information about an annotation (or annotations) associated with a particular content source. Those of ordinary skill in the art and others will also appreciate that a multiple-tier annotation system is readily scalable because of its nodal nature. The nodal nature allows each tier level to be expanded (or contracted) as required without requiring that other tiers be simultaneously expanded (or contracted). A multiple-tier annotation system allows frequently accessed lower tiers of servers to provide minimal information and, in effect, filter access to less frequently accessed higher tiers that provide more information. In the example described above, a tier I server can point to a plurality of tier II servers for indexed information about annotations and each tier II server in turn can point to one or more tier III servers where the annotations are located. Such a system distributes both the bandwidth processing and memory loads associated with obtaining progressively more detailed information. Additionally, as noted above, each tier can be expanded as processing loads increase to provide an efficient increase in processing power, without disturbing the over-all multiple-tier annotation system, making the system readily scalable. Expansion can occur by

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1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

changing capacity on a tier level by either changing the capacity of a single server if a tier is formed by a single server, or by changing the number of servers forming a tier if a tier is formed by multiple servers.

The invention is also directed to posting an annotation on a multiple-tier annotation system. A client sends an annotation post to a tier III server that saves a portion of the annotation post and sends a second portion to a tier II server. The tier II server stores the second portion and sends association information for the annotation to a tier I server. Storing a hierarchy of annotation information on multiple tiers of servers allows queries of the multiple-tier annotation system to be performed more efficiently. In such a system, while lower tier servers get more queries, they also process less information. Thus, query response time is reduced. Higher tier servers, which process more information, get fewer queries since the lower tier servers act as filters for the higher tier servers.

Summary of Cited and Applied References

Summary of LaLiberte

LaLiberte purportedly teaches a solution to address the scalability of group and public annotations in the World Wide Web ("WWW"). The WWW environment may produce a large number of documents to be annotated. A document may include public annotations created and readable by members of the public, and/or group annotations created and readable by members of distinct groups. In the Internet environment, the public is essentially a very large group that can include everyone. Such a critical mass of participants may result in a large number of annotations. To address the scalability problems for annotations, LaLiberte requires each document server to inform a client where to get public annotations for a document, and the user tells the client where to get group annotations for a document.

LaLiberte teaches that each document server references the public annotation servers for that document. This approach potentially distributes the load for serving annotations to at least as many annotation servers as there are document servers, and possibly many more. For

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CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

example, a public annotation server may serve annotations for as many or as few document servers as desired, and a public annotation server may be relocated or replicated independently of the document servers. In addition, an annotation server can delegate annotations of particular documents to yet another server. Optionally, each document server could be its own public annotation server.

With an ever-increasing number of clients asking for annotations, an annotation server will experience increased load. One solution provided by LaLiberte is to treat an annotation as an ordinary document retrieved via HTTP. Such an annotation can be cached closer to a client, much like a document. As a result, an annotation server only needs to deliver an annotation if the annotation is not found in a cache. The reference to the annotation server is stored in the metadata for the document. Since metadata is cacheable just as any other data, a client can look first in caches and only then ask the document server if the metadata is not in the cache.

LaLiberte defines a high-level protocol on top of HTTP for communicating between servers and clients about the availability of annotations, the metadata about each annotation, and the text of the annotations themselves. In essence, the protocol works as follows: a WWW client requests a document from an HTTP server. The HTTP server returns the document, along with an annotation's CGI header that names the URL of the CGI-based public annotation server. The client then queries the public annotation server for the list of annotations associated with the URL of the document. The public annotation server returns the list in the requested format. The client then queries a user-specified group annotation server in the same fashion as the client has queried the public annotation server. The group annotation server then returns a list of annotations associated with the document, accessible only by group members. The client then queries a second group annotation server, which returns another list of annotations; and so on.

In summary, LaLiberte teaches a protocol to address the scalability of annotations in an Internet environment. The protocol enables a client to query an HTTP server, which provides the references to annotation servers containing annotations of the document of interest. Nowhere

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1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

does LaLiberte teach a multiple-tier annotation system that contains a tier I server, a tier II server, and a tier III server. Nor does LaLiberte teach a tier III server that saves a portion of the annotation, a tier II server that saves a second portion of the annotation, and a tier I server that saves association information for the annotation.

Summary of MacNaughton

MacNaughton purportedly teaches a system and method for integrating an online service community with a foreign service such as the Internet World Wide Web. MacNaughton provides a community browser, which includes a set of tools and capabilities that enable Web users with similar interests or shared circumstances to enjoy ongoing social relations. Social relations in an online environment include both real-time interactive approaches, such as chat and gaming, and static interaction approaches, such as viewing annotations and shared bookmarks.

The community browser can be divided into two groups: core components and interaction components. The core components enable the existence of a community through the use of a community server and a community client. The community server maintains communication with the community client that operates on a user's computer. Together, the community server and the community client notify the user of annotations by community members affiliated with a Web page that the user happens to be on. The community server serves requests from the community client by initiating sessions between the appropriate annotation components and the community client, thus enabling annotations to be created and interactions with community members to occur in conjunction with navigating the Web.

The interaction components enable users to engage in ongoing social interactions. The interaction components may comprise message boards, chat, community bookmarks, etc. Message boards enable asynchronous interactions between community members through threaded messaging. Community threaded messages or annotations are associated with a particular Web page that is identified by a URL. When a user navigates to a Web page as

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CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

identified by a URL and for which annotations are available, a Web page containing the annotations is presented on request to the user to allow the user to review or access the annotations.

MacNaughton teaches using a threaded message server to create and retrieve threaded message-type annotations that are associated with specific URLs. As community members interact with each other via message boards, the messages they submit are organized and stored by the threaded message server component for later retrieval based on a particular URL. When another user or the same user later provides the same URL, the community server interacts with the URL database to determine whether annotations are available for the particular URL. If the answer is YES, the community server interacts with the threaded message database to locate the annotations.

In summary, MacNaughton teaches a community browser that enables users with similar interests or shared circumstances to build an online relationship. When a user of a community views a Web page, messages and annotations associated with the Web page that are provided by other community members can be provided to the user. Such annotations are stored in association with the URL of the Web page. MacNaughton teaches a community server queries a URL database to determine whether a Web page with a particular URL is associated with annotations. If the answer is YES, the community server will query a threaded message server to retrieve annotations associated with the URL. Therefore, the community server contains no indexing information of the annotations stored on the threaded message server. Therefore, the community server does not act as a tier II server for storing an index of annotations stored on the tier III server, as recited by claims of the invention.

Summary of Eintracht

Eintracht purportedly teaches a system for collaborative document annotation, employing a central notes server and multiple notes clients. It teaches storing notes such as annotations associated with a document in a notes database on the central notes server. The central notes

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CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

server also contains a Web server application, which functions to capture requests from one or more notes clients for creating, storing, editing, and retrieving annotations related to specific documents stored on the notes server. A notes client functions to display the document that a user wishes to annotate and also provides the tools necessary to permit the user to create, add, delete, retrieve, and store notes.

A synchronization process transmits the annotation generated by the user from the notes client to the central notes server. In response, the central notes server transmits back an acknowledgement along with any new notes that other notes clients may have posted since the last synchronization was performed. As a result, Eintracht enables multiple notes clients to annotate a document asynchronously with respect to each other. When a notes client posts a page to the central notes server, the state of the annotation database is synchronized such that all other notes clients can retrieve the current, up-to-date annotations associated with a document.

Eintracht also teaches a client annotation event data structure comprising multiple fields for conveying note data from a notes client to a notes server. The data structure includes a document ID field that comprises the URL of the annotated document, local time of the client along with the time zone of the client, the note owner ID that uniquely identifies the user and the number of notes contained in the message for the notes server. Following the number of notes is a buffer containing the notes.

In summary, Eintracht provides a system that has a central notes server and one or more notes clients. Eintracht also teaches a data structure including multiple fields for conveying note data from a notes client to a notes server. Nowhere does Eintracht teach a multiple-tier annotation system wherein each higher tier server includes more annotation information than lower tier servers. Neither does Eintracht teach posting a hierarchy of annotation information on a multiple-tier annotation system. Nor does the data structure taught by Eintracht include references to the servers in the multiple-tier annotation system.

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

The Claims Distinguished

The Office Action has failed to show, and the applicants are unable to find, where any of the cited and applied references, either alone or in combination, disclose, teach or suggest the subject matter of the claimed invention. Among other differences, none of the cited and applied references teaches, discloses, or suggests storing annotations on the servers of a higher tier and information about annotations on the servers of lower tiers of a multiple-tier hierarchical annotation system. As noted above, neither of the cited references provides scalable systems employing multi-tier hierarchical annotation servers of the type contemplated by the present invention. As discussed more fully below, Claims 1-28 clearly recite scalable methods, computer-readable media, or computing systems not taught or even remotely suggested by the cited references, taken alone or in combination.

Rejection of Independent Claim 1 and Dependent Claims 4-7 Under 35 U.S.C. § 103(a)

Claim 1, in its present form, reads as follows:

> 1. A computing system for scalably managing annotations, the computing system comprising:
> a tier III server for storing annotations;
> a tier II server for storing an index of the annotations stored on the tier III server, but not the annotations, that is separate and distinct from the tier III server; and
> a tier I server for determining if a content source has an index of the annotations stored on the tier II server that is separate and distinct from the tier II and tier III servers.

Claim 1 recites a multiple-tier computing system that provides an easily scalable way of retrieving annotation information. The Office Action alleges that LaLiberte and MacNaughton combined teach the subject matter recited by Claim 1. Applicants respectfully disagree. First, neither LaLiberte nor MacNaughton teach the multi-tiered annotation system recited in Claim 1. For example, as correctly concluded by the Office Action, LaLiberte fails to teach a tier II server for storing an index of the annotations stored on the tier III server. Therefore, LaLiberte does not teach the subject matter recited in Claim 1.

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1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

Though the Office Action correctly concludes that LaLiberte does not teach a tier II server recited in Claim 1, the Office Action alleges that MacNaughton makes up for LaLiberte's deficiency. Applicants respectfully disagree. As noted above in the summary of MacNaughton, the community server taught by MacNaughton interacts with a URL database to determine whether annotations are available for a particular URL. If the URL database indicates annotations are available for this particular URL, the community server interacts with a threaded message database to locate the annotations associated with the URL. See MacNaughton, Col. 8, lines 42-57. Nowhere does MacNaughton teach that the community server stores an index of the annotations associated with a particular URL. Therefore, MacNaughton does not teach a tier II server for storing an index of the annotations stored on the tier III server, as recited in Claim 1. Therefore, MacNaughton does not teach the subject matter recited in Claim 1. Nor does MacNaughton make up the deficiency in LaLiberte with regard to the subject matter recited in Claim 1.

In summary, none of the cited references discloses or suggests, alone or in combination, the multiple-tier annotation system recited in Claim 1. Thus, applicants submit that Claim 1 and all the claims dependent therefrom (Claims 2-9) are clearly allowable.

Rejection of Dependent Claims 9 and 28 Under 35 U.S.C. § 103(a)

The dependent Claims 9 and 28 recite that a document identifier identifying a content source with which one or more annotations are associated can be any of a directory path, a uniform resource locator, and a file name. Applicants cannot locate any pertinent subject matter in the portion of text of LaLiberte (page 4, first paragraph) cited by the Office Action. In this portion of text in LaLiberte, LaLiberte teaches a URL of an annotation, instead of a URL of the document that the annotation is associated with. Therefore, LaLiberte does not teach the subject matter recited in dependent Claims 9 and 28. Therefore, the dependent Claims 9 and 28 are allowable in addition to the reasons that their corresponding independent Claims 1 and 25 are allowable.

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1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

Rejection of Independent Claim 10 and Dependent Claims 11-15 Under 35 U.S.C. § 103(a)

Independent Claim 10, in its present form, reads as follows:

> 10. A scalable computerized method of posting an annotation, the method comprising:
> sending an annotation post from a client to a tier III server;
> storing a portion of the annotation post on the tier III server;
> sending a second portion of the annotation post from the tier III server to a tier II server that is separate and distinct from the tier III server;
> storing the second portion of the annotation post on the tier II server;
> sending association information from the tier II server to a tier I server that is separate and distinct from the tier II and tier III servers; and
> storing the association information on the tier I server.

Claim 10 recites a method of posting a hierarchy of annotation information by a client on the various tiers of a multiple-tier annotation system. The Office Action alleges that LaLiberte and MacNaughton combined teach the subject matter recited in Claim 10. Applicants respectfully disagree. First of all, LaLiberte teaches a protocol for a WWW client that requests and retrieves annotations associated with a particular document. See LaLiberte, page 5. Nowhere does LaLiberte teach a method for posting an annotation, much less in the multiple-tier manner recited in Claim 10. For example, nowhere does LaLiberte teach sending an annotation post from a client to a tier III server, storing different portions of the annotation post on a tier III server and a tier II server, or sending and storing association information from a tier II server on a tier I server. Therefore, LaLiberte does not teach the subject matter recited in Claim 10 at all.

Secondly, nowhere does MacNaughton teach a computerized method of posting an annotation either. Applicants have been unable to locate any pertinent subject matter in the portions of MacNaughton (Col. 21, line 52, to Col. 23, line 33; Col. 8, lines 10-27; Figs. 1A-1B) referenced in the Office Action. For example, in these portions of text, nowhere does MacNaughton teach posting portions of an annotation on a tier III server and a tier II server, or storing association information from the tier II server on a tier I server.

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CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

Further, the Office Action alleges that MacNaughton makes up LaLiberte's deficiency in failing to teach "sending and storing a second portion of the annotation post on the tier II server." Applicants respectfully disagree. As noted above when discussing Claim 1, the community server taught in MacNaughton checks with a URL database that stores URLs with which the annotations are associated. The community server itself is not a tier II server since the community server contains no index of the annotations. Furthermore, a URL is not a portion of annotation in any sense; neither does MacNaughton teach that a portion of an annotation includes the URL that the annotation is associated with.

Furthermore, as discussed above, Claim 10 is about posting an annotation in a multiple-tier annotation system. Claim 10 is not about the retrieval of requested annotations among a network of servers, as suggested by the Office Action. See Office Action, page 5, third paragraph.

Therefore, applicants assert that the subject matter of Claim 10 is clearly not taught or suggested by the cited and applied references and, thus, Claim 10 is clearly in condition for allowance. Since Claims 11-21 are dependent from Claim 10, Claims 11-21 are submitted to be allowable for at least the same reasons noted above.

Rejection of Independent Claim 25 and Dependent Claim 8 Under 35 U.S.C. § 103(a)

Independent Claim 25, in its present form, reads as follows:

> 25. A scalable computerized method for managing annotations, the method comprising:
>
> storing within a tier I server reference to a tier II server storing an index that identifies a tier III server that stores an annotation associated with a content source;
>
> storing within a tier II server that is separate and distinct from the tier I server an index that identifies the tier III server that stores an annotation associated with a content source;
>
> storing within a tier III server that is separate and distinct from the tier I and tier II servers the annotation associated with a content source;
>
> receiving by the tier I server from a client a document identifier that identifies the content source; and

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1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

providing a first response to the client from the tier I server, wherein the first response comprises one or more associations for the document identifier and a reference to a tier II server for each of the associations.

As already discussed above with regard to Claim 1 and Claim 10, none of the LaLiberte and MacNaughton references teaches, discloses, or suggests a multiple-tier hierarchical annotation server system with separate and distinct tier I, II, and III servers, let alone a tier II server storing an index of annotations stored on a tier III server. Furthermore, nowhere does Claim 25 recite "storing within tier I server reference that identifies a tier III server," as suggested by the Office Action. See Office Action, page 5, penultimate paragraph.

Furthermore, contrary to what the Office Action suggests (see Office Action, page 6, first paragraph), nowhere does LaLiberte teach providing a first response to the client from the tier I server, wherein the first response comprises one or more associations for the document identifier and a reference to a tier II server for each of the associations. As correctly concluded by the Office Action (see Office Action, page 6, third paragraph), LaLiberte does not teach a tier II server, not to say a reference to a tier II server.

Again, the Office Action alleges that MacNaughton makes up LaLiberte's deficiency in failing to teach a tier II server. As noted above when discussing Claims 1 and 10, the community server taught by MacNaughton is not a tier II server that stores an index of the annotations.

Clearly, none of the LaLiberte and MacNaughton references, alone or in combination, renders Claim 25 obvious. Therefore, applicants assert that Claim 25 is allowable. Since Claims 26-28 are dependent from Claim 25, Claims 26-28 are submitted to be allowable for at least the same reasons noted above.

Rejections of Dependent Claims 26 and 27 Under 35 U.S.C. § 103(a)

Claims 26-27 include additional recitations that further distinguish them from the teaching of LaLiberte and MacNaughton and, thus, are submitted to be allowable for additional reasons besides the reasons that their independent Claim 25 is allowable. For example, Claim 26 recites that the tier II server receives from the client a "selection identifying one of the

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1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

associations for the document identifier" and provides the client a second response. The Office Action suggested that LaLiberte teaches the subject matter recited by Claim 26. Applicants respectfully disagree. As the Office Action has correctly concluded repeatedly, LaLiberte fails to teach a tier II server that stores an index of the annotations stored on a tier III server. Therefore, LaLiberte cannot possibly teach "receiving by the tier II server from the client a selection identifying one of the associations for the document to identify," as recited by Claim 26.

Further, LaLiberte does not teach providing a second response to the client, let alone a second response that "comprises a header for each of the annotations associated with the document identifier and the reference to the tier III server for each annotation." The second response improves the efficiency of the present invention. A first response is received from a tier I server, which gives a simple and quick response indicating whether annotations exist, while the second response from the tier II server gives further information and identification of a tier III server that stores the associated annotation. Such behavior and capabilities are not taught, disclosed, or suggested by the LaLiberte and MacNaughton references. Therefore, LaLiberte cannot possibly teach the subject matter disclosed in Claim 26.

Claim 27 includes the recitation of "providing a third response to the client from the tier III server." Since LaLiberte does not teach a third response, Claim 27 is submitted to be allowable for this reason as well.

Rejection of Independent Claims 22-24 Under 35 U.S.C. § 103(a)

Independent Claims 22-24, in their present form, read as follows:

> 22. A computer-readable medium having stored thereon a "client-to-tier III server" data structure for scalable annotations, comprising:
> a first field containing data representing a context document identifier;
> a second field containing data representing a body of the annotation;
> a third field containing data representing generic properties of the annotation;
> a fourth field containing data representing type specific properties of the annotation;

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1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

a fifth field containing data representing a URL for a tier III server for receiving and storing a portion of the post of the annotation;

a sixth field containing data representing a URL for a tier II server for receiving and storing a portion of the post of the annotation wherein the URL for the tier II server is distinct from the URL for the tier III server; and

a seventh field containing data representing a URL for a tier I server for receiving and storing associations for the annotation, wherein the URL for the tier I server is distinct from the URLs for the tier II and tier III servers.

23. A computer-readable medium having stored thereon a "tier III server-to-tier II server" data structure for scalable annotations, comprising:

a first field containing data representing a context document identifier;

a second field containing data representing generic properties of the annotation;

a third field containing data representing a URL for a tier III server for receiving and storing a portion of the post of the annotation;

a fourth field containing data representing an identifier for the portion of the post of the annotation stored on the tier III server;

a fifth field containing data representing a URL for a tier II server for receiving and storing a portion of the post of the annotation wherein the URL for the tier II server is distinct from the URL for the tier III server; and

a sixth field containing data representing a URL for a tier I server for receiving and storing associations for the annotation, wherein the URL for the tier I server is distinct from the URLs for the tier II and tier III servers.

24. A computer-readable medium having stored thereon a "tier II server-to-tier I server" data structure for scalable annotations, comprising:

a first field containing data representing a context document identifier;

a second field containing data representing an indexing identifier of the annotation;

a third field containing data representing a URL for a tier II server for indexing the annotation; and

a fourth field containing data representing a URL for a tier I server for receiving and storing associations for the annotation, wherein the URL for the tier I server is distinct from the URL for the tier II server.

Respectively, Claims 22-24 recite three different data structures containing multiple fields for storing annotation related data in multiple servers in the annotation system, such as a tier I server, a tier II server, and a tier III server. The Office Action alleges that LaLiberte, MacNaughton, and Eintracht combined teach the subject matter recited in Claims 22-24. Applicants respectfully disagree.

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1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

First, as already discussed above with regard to independent Claims 1, 10, and 25, none of the LaLiberte and MacNaughton references teaches, discloses, or suggests a multiple-tier annotation system including tier I, II, and III servers, let alone a tier II server storing indexing information of annotations stored in a tier III server. Further, as the Office Action correctly concludes (see Office Action, page 12, penultimate paragraph), nowhere do LaLiberte and MacNaughton teach a data structure of fields containing annotation information in a multiple-tier annotation system. Therefore, LaLiberte and MacNaughton do not teach the subject matter recited in Claims 22-24.

In addition, contrary to what the Office Action suggests, Eintracht fails to make up the deficiency in LaLiberte and MacNaughton with regard to the subject matter recited in Claims 22-24. First of all, Eintracht does not teach a multiple-tier annotation system including tier I, tier II, and tier III servers. As noted above in the summary of Eintracht, Eintracht provides a system including a central notes server and one or more notes clients. Eintracht does not teach a multiple-tier annotation system including at least three tiers of servers. Consequently, the client annotation event data structure taught by Eintracht includes no reference to a tier I server, a tier II server, or a tier III server, as recited in Claims 22-24. As a result, the Office Action's rejection of independent Claim 22 and dependent Claims 3 and 16-18, independent Claim 23 and dependent Claims 2 and 19-20, independent Claim 24 and dependent Claim 21 should be withdrawn and these claims be allowed.

CONCLUSION

In view of the foregoing comments, applicants respectfully submit that all of the claims in this application are clearly allowable in view of the cited and applied references. Consequently, reconsideration and reexamination of this application, allowance of rejected Claims 1-28, and passage of this application to issue at an early date are respectfully solicited. If

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CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

the Examiner has any questions or comments concerning this application, the Examiner is invited to contact the applicants' undersigned attorney at the number below.

Respectfully submitted,

CHRISTENSEN O'CONNOR
JOHNSON KINDNESS[PLLC]

Joy Y. Xiang
Registration No. 55,747
Direct Dial No. 206.695.1607
E-Mail Address: joy.xiang@cojk.com

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CHRISTENSEN O'CONNOR JOHNSON KINDNESS[PLLC]
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100